Teacher sheet – Lesson plan

Floating and Sinking 1

Introduction

These 3 lessons give children the opportunity to plan and carry out an investigation into floating and sinking. The focus of each lesson is on scientific enquiry.

QCA Schemes of Work: KS2 Science Unit 6E Forces in Action

Learning Objectives

To plan an investigation into how the type of liquid might affect the way an object floats or sinks.
To understand how to carry out a fair test.

The Curriculum
England - KS2 SC1 2c, 2d
Scotland - Science: Investigating, Level C/D
Wales - KS2 Science: Scientific Enquiry 1.1, 3.1, 3.2, 3.3, 3.4, 3.5

Resources

Floating and Sinking worksheet 1a or 1b (use 1b for younger or less able children), plasticine ball, paper straw marked as a ruler.

Key Vocabulary

Liquid, balanced forces, unbalanced forces.

Teaching Activities

Introduction Remind the children about what they have learnt so far about balanced and unbalanced forces, in particular floating and sinking. Explain that today you are going to be investigating different liquids to see how objects float or sink in them. Can the children name some different liquids? Can they suggest how the type of liquid might affect the way an object floats or sinks? What is it about a liquid which might affect an object?

Activities Can the children think of a way to carry out an investigation in to how an object floats in different liquids? What would they keep the same? What would they vary? What would they measure?
Suggest to the children that they use a lump of plasticine as the object and that you stick into it a paper straw marked as a ruler. The plasticine and straw could then be placed into the different liquids to see how high it floats, taking measurements from the plastic straw. Show the children an example of the plasticine ball and straw ruler.
Get the children to think of some different liquids they would like to use. Encourage them to try and think of liquids of different densities. Depending on the equipment available, you may wish the children to work in small groups and choose their own liquids. Alternatively, the class could use the same liquids.
Distribute Floating and Sinking worksheets 1a or 1b. Discuss each section on the sheet in turn and in particular ask them to consider how they are going to make their investigation a fair test. Suggested answers, using contributions from the class, could be written on the board for the children to copy.

Plenary At the end of the lesson, get the children to begin to consider what their prediction will be.
Ask them to use what they already know from everyday life to help them.

Continued...

Floating and Sinking 1

Differentiation	Older or more able children may be given less guidance in how to carry out their investigation once the initial discussion has taken place.
Cross-curricular	This lesson may be linked with work in DT/Technology.

Teacher sheet – Lesson plan

Floating and Sinking 2

Introduction

These 3 lessons give children the opportunity to plan and carry out an investigation into floating and sinking. The focus of each lesson is on scientific enquiry.

QCA Schemes of Work: KS2 Science Unit 6E Forces in Action

Learning Objectives

To make systematic measurements and record them appropriately using a table.

The Curriculum:
England - KS2: SC1 2f, 2h
Scotland - Science: Investigating, Level C/D
Wales - KS1 Science: Scientific Enquiry 1.3, 2.2, 3.8

Resources

Floating and Sinking worksheet 2a or 2b (use 2b for younger or less able children), plasticine, rulers, paper straws, transparent beakers, different liquids.

Key Vocabulary

Liquid, measure, surface level, upthrust, forces, prediction.

Teaching Activities

Introduction Remind the children about how they have planned the investigation so far. Ask them to suggest reasons for their predictions, encourage them to use their own experience to generalise. Older children should be encouraged to base their predictions on scientific knowledge. Get the children to complete the prediction section on Floating and Sinking worksheet 2a or 2b.

Activities Discuss the results the children will be collecting. Can anyone draw a table which can be used to collect results? How will the columns be labelled? If you are using worksheet 2a get the children to add the labels to the table.
In pairs, give the children a lump of plasticine and a paper straw. Explain that they need to mark the straw in to centimetres (or half centimetres). The straw then needs to be stuck into the plasticine.

Ask the children to explain to you how they will keep the test fair. Model for the children the best way of gathering results. Remind them that they will be measuring from the top of the plasticine ball to the surface level. If you are conducting the experiment as a class then place the beakers filled with the different liquids at the front of the class and let the children carry out the experiment two at a time to a beaker. If the children are working in groups then you will need beakers with the different liquids for each group. The children should record their results on the table.

Plenary Ensure that all groups have carried out their investigations and recorded their findings which will be discussed in the next lesson.

Differentiation

You may wish to give older or more able children less guidance on how to carry out and record their findings, but they must be able to explain their actions.

Cross-curricular

This lesson may be linked with work in DT/Technology.

Teacher sheet – Lesson plan

Floating and Sinking 3

Introduction

These 3 lessons give children the opportunity to plan and carry out an investigation into floating and sinking. The focus of each lesson is on scientific enquiry.

QCA Schemes of Work: KS2 Science Unit 6E Forces in Action

Learning Objectives

To use observations and measurements to evaluate and draw conclusions and relate these findings to predictions made. To review their findings and describe its significance in the everyday environment.

The Curriculum:
England - KS2: SC1 2j, 2k, 2l, 2m
Scotland - Science: Investigating, Level C/D
Wales - KS2 Science: Scientific Enquiry 3.11, 3.12, 3.13, 3.14

Resources

Floating and Sinking worksheet 3a or 3b (use worksheet 3b for younger or less able children).

Key Vocabulary

Liquid, measure, surface level, upthrust, forces, conclusion, evaluation.

Teaching Activities

Introduction Ask one of the children to recap on the investigation and how it was carried out.

Activities Compare the results from different groups of children. What has the class learnt? Were their predictions correct? Can they draw any conclusions? Get the children to write their conclusions into the space in Floating and Sinking worksheet 3a or 3b. Now look again at the results from the different groups of children. Are there any anomalies? Can any of the children explain them? Were there any areas of the investigation where practical difficulties might have led to unfair results? Were there any particularly tricky parts to the investigation? How difficult was it to measure accurately? If you were to repeat the investigation could you think of any way that the fairness of the test could be improved? Get the children to complete Floating and Sinking worksheet 3a or 3b.

Plenary At the end of the lesson, ask the children if they can think of a way in which hat they have learnt about upthrust and different liquids can be used practically in the everyday environment.

Differentiation

Use worksheets 3a or 3b accordingly.

Cross-curricular

This lesson could be linked with work in DT/Technology.

Follow-up

Investigate how objects can be weighed in a liquid by using forcemeters.

Worksheet 1a

Floating and Sinking

Name Date

Complete the sheet to help you plan your investigation.

An investigation to find out _____

_____

What we will do:

We will measure:

We will change:

We will keep these things the same:

What we will need:

☐ I can begin to plan an investigation.

Worksheet 1b

Floating and Sinking

Name Date

Complete the sheet to help you plan your investigation.

An investigation to find out _____

_____

What we will do:

_____

_____

_____

_____

We will measure:

_____

_____

We will change:

_____

We will keep these things the same:

_____

What we will need:

_____

_____

☐ I can begin to plan an investigation.

Worksheet 2a

Floating and Sinking

Name Date

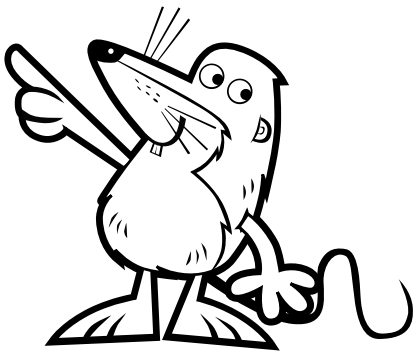
Complete the sheet to help you carry out your investigation.

The **four** liquids I will use are:

My prediction is that

Because

Think carefully about what you have decided to measure. Then, **label** the table and fill it in.



☐ I can record results accurately.

Worksheet 2b

Floating and Sinking

Name Date

Complete the sheet to help you carry out your investigation.

The **four** liquids I will use are: _____

_____

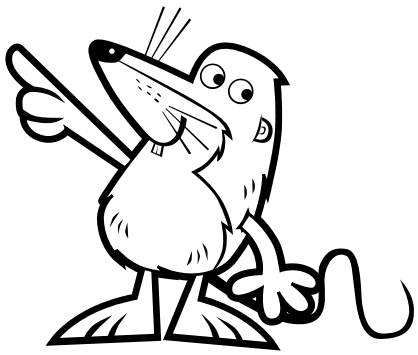
My prediction is that _____

_____

Because _____

Type of liquid	Depth below surface level

Measure the depth of the plasticine carefully and fill in the table.



☐ I can record results accurately.

Worksheet 3a

Floating and Sinking

Name Date

Complete the sheet to record your conclusion and evaluation.

Conclusion

I think my results show

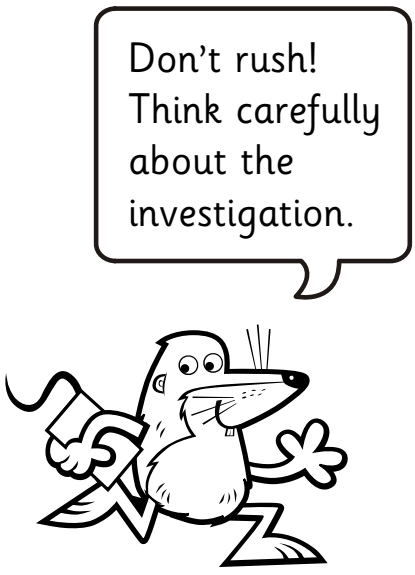
From the investigation I have learned

Evaluation

The most difficult part of the investigation was

I trust my results because

If I were to do the investigation again I would



☐ I can evaluate my work.

Worksheet 3b

Floating and Sinking

Name Date

Complete the sheet to record your conclusion and evaluation.

Conclusion

I have learned that _____

_____

_____

Evaluation

It was hard to _____

_____

_____

Measuring was _____

_____

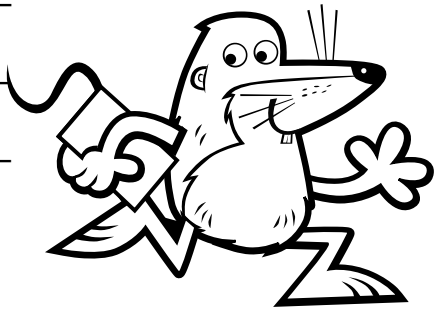
_____

My results were _____

_____

_____

Don't rush! Think carefully about the investigation.



☐ I can evaluate my work.